Space Weather Forecast

Issued on Wednesday 27 November 2024 at 12:00 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate to High Solar Activity expected with Moderate-flares likely. G1/G2 Minor-Moderate Geomagnetic Storm expected 28 Nov.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low in the past 24 hours with Common-class flares observed, and recently peaking just below Moderate class from a flare originating from an active region in the southwest.

There are currently eight numbered and one un-numbered active regions on the visible disc. The two largest and most magnetically complex spot regions are both in the southeast, approaching centre-disc. The other region of note is located toward the northeast limb. This region was responsible for a near-Strong flare flare on 25 Nov as it rounded the limb.

There is currently one likely Earth-directed CME (coronal mass ejection) during the period. A filament eruption in the southwest led to an associated CME being ejected from the Sun. This has been analysed as Earth-directed with an impact arrival time likely during the UTC morning of 28 Nov (Day 2).

Solar Wind / Geomagnetic Activity: Solar winds were at background levels, near 340-390km/s. The Interplanetary Magnetic Field was Weak throughout. The north-south component, Bz, varied weakly between north and south orientations. Geomagnetic activity was Quiet (Kp 0-2).

Energetic Particles / Solar Radiation: Solar Radiation remained at Background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate activity is forecast, with occasional Moderate-class flares likely and a slight chance of isolated Strong flares, primarily from the large regions in the southeast disc, or a region currently located close to the northeast limb.

Solar Wind / Geomagnetic Activity: A CME (coronal mass ejection) that left the Sun late on 25 Nov from the southwest disc is likely to affect Earth on Day 2 (28 Nov). Solar wind speeds are currently at Background levels and are expected to remain so during Day 1 (27 Nov). Solar winds are likely to increase to Elevated levels following the CME arrival on Day 2 (Nov 28), before gradually declining by Day 4 (30 Nov) as CME influences begin to wane.

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Geomagnetic activity is expected to be mainly Quiet to Unsettled (Kp0-3) at first. Upon arrival of the CME on Day 3 (28 Nov), G1/G2 Minor/Moderate Geomagnetic Storms are expected, with a slight chance of G3/Major Geomagnetic Storm intervals. Enhanced conditions are likely to persist into Day 4 (29 Nov).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to persist at Background levels, with a slight but increasing chance of Solar Radiation storms occurring later in the period, mainly from the large sunspot regions in the southeast.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	80	60	10
Strong	G3	No	1	20	10	1
Severe	G4	No	1	5	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	No	70	70	70	70
Very Active	R3-R5 (X Class)	No	15	15	15	15

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	15	15	20	20
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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